How to Operate an Underground Mine Refuge Chamber: MineARC MineSafe Series IV Procedure

This procedure explains how to operate an underground mine refuge chamber, specifically the MineARC Systems MineSafe standard design refuge chamber with Series 4 scrubbing. It covers entering and securing the chamber, checking compressed air, running air conditioning, gas monitoring and scrubbing, oxygen regulator and oxygen candle operation, manual gas testing, and ongoing maintenance. Follow the steps in order and keep the Operating Procedures Manual within reach.



MineARC refuge chamber labeled MAA-403 in a smoky environment, showing capacity and safety labels, a mounted fire extinguisher and indicator lights

Purpose

This procedure covers the MineARC Systems MineSafe Series IV refuge chamber, whose maximum capacity is shown on the chamber label (for example, "12 PERSONS MAXIMUM"). The activity is operating the chamber's life support systems during an emergency. These systems are compressed air, air conditioning, gas monitoring, CO_2 and CO scrubbing, oxygen cylinders and the oxygen candle. The safety objective is to keep the breathing air inside the chamber within the acceptable gas monitor levels listed on the Life Support Settings Table:



Open supply box with the person preparing items and the oxygen candle seated in its holder

- O_2 between 18.5% and 23%
- CO_2 at or below 1%
- CO at or below 25 ppm

Hazards

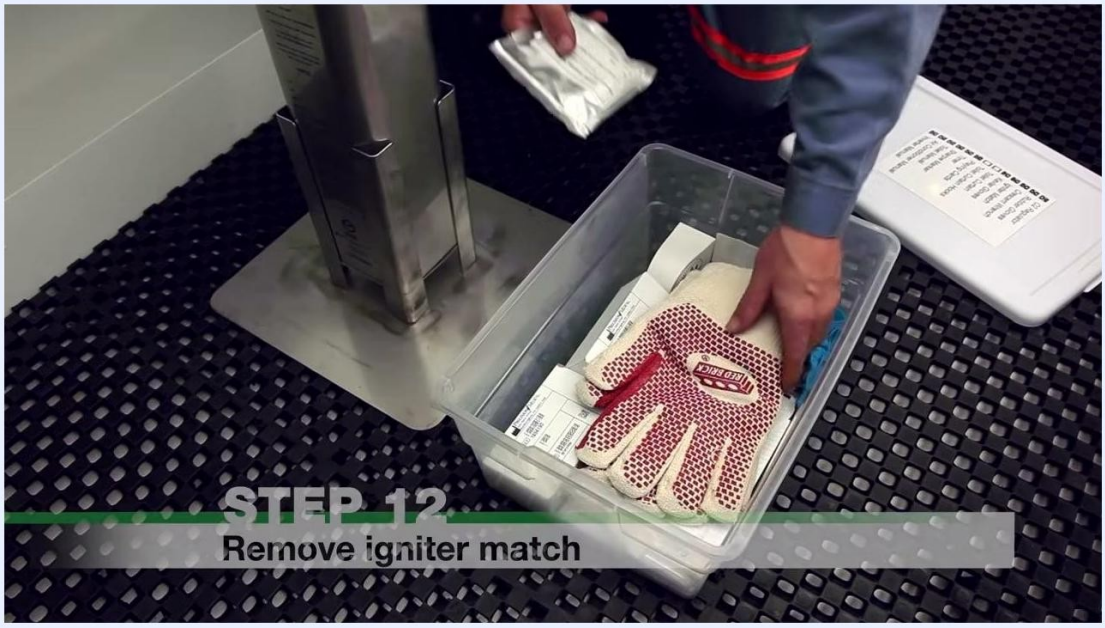
The source material identifies the following hazards. Ground control, mobile equipment, explosives, dust, water and fatigue hazards are not addressed in the source. If your site requires them to be listed, add them from your site risk assessment.

Gas hazards

- Excess carbon monoxide (CO). The scrubber must be started if CO exceeds 25 ppm.
- Excess carbon dioxide (CO_2). The MARCISORB CO_2 chemical must be replaced if CO_2 exceeds 1%.
- Insufficient or excess oxygen (O_2). The O_2 regulator must be adjusted if O_2 falls below 18.5% or rises above 23%.

Oxygen candle hazards

- An ignited oxygen candle generates extreme heat. Bare-hand contact with the candle or its holder after ignition can cause burns or injury.
- The tear seal on the candle has exposed sharp edges.
- The igniter match has a red phosphorus tip that you must not touch directly.
- Oil, grease or other contamination on a candle, its holder, or an oxygen regulator or cylinder valve is a hazard.



Oxygen candle in its holder with an on-screen instruction to ignite the oxygen candle

Other hazards

- Glass detector tubes used for manual gas testing must be handled with care to avoid injury.
- External power can fail. The air conditioning temperature must then be set to 86°F (30°C).

- Compressed air can fail. If it does, you must close the compressed air valve and switch to the scrubber.

Responsibilities

The source material assigns tasks to "you", the person operating the chamber, and to maintenance personnel. It does not define supervisor, spotter or control room duties.

- **Operator (chamber occupant):** You carry out every step in this procedure. This includes monitoring gas levels, adjusting the oxygen regulator, replacing cartridges, igniting the oxygen candle when required and recording results. You also follow the Operating Procedures Manual and the warnings on the equipment.
- **Maintenance:** Maintenance personnel perform weekly checks of the chamber's systems and arrange regular servicing by authorized personnel, such as MineARC Systems technicians. Servicing includes inspection of external and internal components such as fire extinguishers, doors and control panels.
- **Supervisor, spotter and control room:** The source does not assign duties to these roles. Your site's role descriptions belong here, such as who authorizes chamber use and who receives status reports.



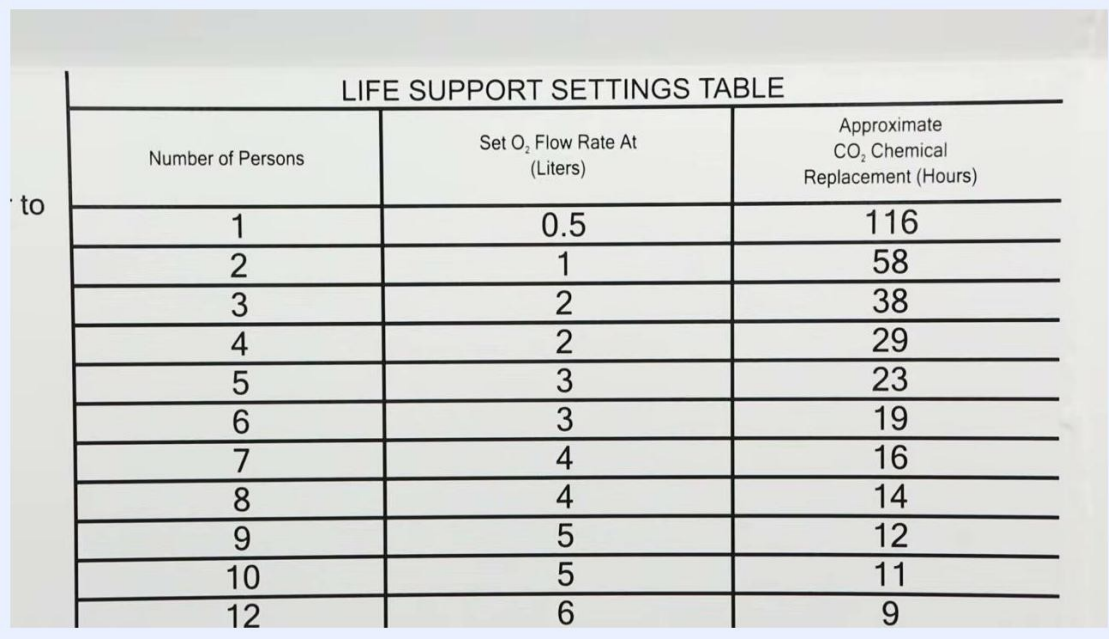
The MineARC Systems logo and website URL (www.minearc.com) are displayed on a white background.

Pre-task checks

Complete these checks before you rely on the chamber, and refer back to them as conditions change. The source does not mention permits, communication checks, barricades or ground inspection. Add them here if your site requires them.

- **Chamber readiness:** Inspect the chamber exterior for status lights and safety labels. Confirm that the capacity label (for example, "12 PERSONS MAXIMUM") and the unit number (for example, "MAA-403") are visible. Confirm that safety equipment such as the fire extinguisher is present and accessible.
- **Documentation:** Know where the Operating Procedures Manual is stored. It is a binder with photographic step-by-step instructions, kept in the compartment labeled **OPERATING PROCEDURES MANUAL** in the yellow MineARC SYSTEMS cabinet on the chamber wall.
- **Personal protective equipment:** Keep the supplied gloves available. Use them when fitting the oxygen regulator and whenever you handle an ignited oxygen candle. If you are wearing a self-rescuer, keep it on until the gas monitor levels are confirmed as acceptable.
- **Oxygen equipment condition:** Make sure the oxygen regulator and cylinder valve are free of oil, grease and other contaminants. Make sure your hands are also free of oil or grease before you handle the oxygen candle.
- **Oxygen candle condition:** Check the steel structure of the candle and its holder for damage, oil or grease contamination. Confirm the candle seal has not been breached. Do not use a damaged or contaminated unit.
- **Recording equipment:** Locate the timer and marker provided in the chamber. Locate the gas level recording charts at the rear of the photographic operating procedures manual.

- **Manual testing supplies:** Have the GASTEC sampling pump and detector tubes ready. These are 31B for oxygen, 2L for carbon dioxide and 1LC for carbon monoxide.



LIFE SUPPORT SETTINGS TABLE

Number of Persons	Set O_2 Flow Rate At (Liters)	Approximate CO_2 Chemical Replacement (Hours)
1	0.5	116
2	1	58
3	2	38
4	2	29
5	3	23
6	3	19
7	4	16
8	4	14
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12	6	9

Life Support Settings Table listing the number of persons, O_2 flow rate in liters and CO_2 chemical replacement hours



Person placing a rectangular metal oxygen candle upright into the metal holder on the floor



Person in a blue work uniform seated and holding open the Operating Procedures Manual binder, with the Gas Monitoring section visible

Safe work steps

Step 1: Enter and secure the refuge chamber

1. Approach the refuge chamber door.
2. Rotate the door handles to the vertical unlock position to open the chamber.
3. Enter the chamber.
4. Rotate the handles to the horizontal lock position to secure the door.
5. Confirm that the lights and siren activate automatically through the motion sensor.

6. If the siren does not activate, turn it on manually using the switch located above the door.



MineSAFE Standard Design Series IV refuge chamber exterior showing the door, handles, labels and safety signage

Leave the siren on during an emergency. It helps personnel locate the refuge chamber.

Step 2: Check the compressed air

1. Locate the CAMS Electronic Control Unit (ECU) inside the chamber.
2. Push the button on the ECU until the blue light illuminates. This shows the system is active.
3. Check that the compressed air valve is fully in the open position.

4. Hold your hand over the auto muffler and feel for air flow. This confirms compressed air is being supplied.



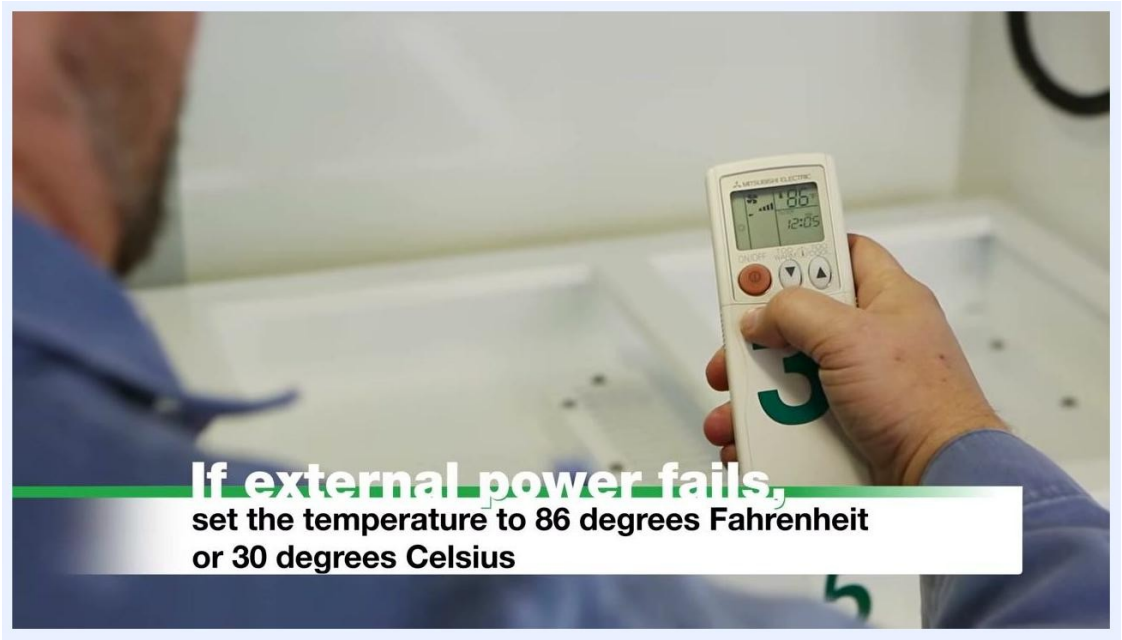
Refuge chamber interior showing compressed air cylinders, control panels, labeled equipment and seating

Do not adjust the regulator. The flow is preset for safe operation.

Step 3: Turn on the air conditioning

1. Turn on the air conditioning with the remote control provided.
2. Alternatively, start the air conditioner manually by pressing the **EOSW** button on the control panel.

3. If external power fails, set the air conditioning temperature to 86°F (30°C).

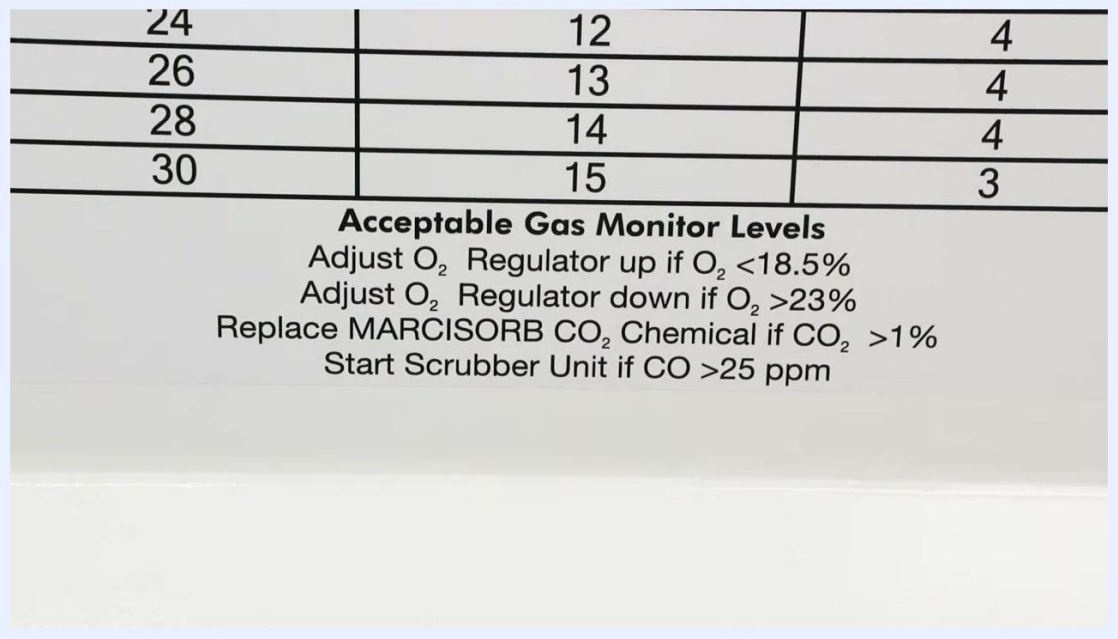


Operator holding the air conditioning remote, with the display showing 86°F and labeled buttons visible

Step 4: Start gas monitoring in the refuge chamber

1. Use the remote control to activate the Aura FX Fixed Gas Monitor, or prepare the manual gas sampling tubes.
2. If you are wearing a self-rescuer, do not remove it until the gas monitor levels are confirmed as acceptable.
3. Refer to the life support settings table on the chamber wall for guidance on alarm readings and on maintaining breathing air quality.
4. Expect the Aura FX fixed gas monitor to alarm periodically when it detects changes in gas levels. Act only on alarms showing readings outside the acceptable gas monitor levels, and remain calm during any alarm event.
5. If the monitor indicates high carbon monoxide (CO), start scrubbing or check that the MARCISORB CO cartridge is seated correctly.

6. If compressed air fails, or gas monitoring reads outside the acceptable gas levels, close the compressed air valve and continue with Step 5.



Aura FX Fixed Gas Monitor panel with digital displays for temperature, O_2 %, CO_2 % and CO ppm, with warning labels and the control panel visible

The acceptable gas monitor levels on the chamber wall table are:

- Adjust the O_2 regulator up if O_2 is below 18.5%.
- Adjust the O_2 regulator down if O_2 is above 23%.
- Replace the MARCISORB CO_2 chemical if CO_2 is above 1%.
- Start the scrubber unit if CO is above 25 ppm.

Step 5: Install the MARCISORB CO_2 cartridges

1. Remove two MARCISORB carbon dioxide cartridges from their storage location.
2. Take the cartridges out of their packaging.
3. Place the cartridges on the right-hand side and center of the scrubber unit.
4. Slot each cartridge into place with the rubber seals on the bottom side.

5. Replace the cartridges when the gas monitor reads CO_2 above 1%, or at the interval shown in the life support settings table on the chamber wall.



Operator removing the MARCISORB CO_2 cartridge box from a storage compartment labeled with MineARC branding and cartridge count

Step 6: Use the Life Support Settings Table

The **LIFE SUPPORT SETTINGS TABLE** is on the refuge chamber wall. Use it to find:

- The correct oxygen flow rate for the number of persons in the chamber.
- The approximate CO_2 chemical replacement interval, in hours.

The table covers group sizes up to 12 persons. Two examples from the table:

- 1 person: O_2 flow rate 0.5 liters, CO_2 chemical replacement every 116 hours.

- 6 persons: O_2 flow rate 3 liters, CO_2 chemical replacement every 19 hours.



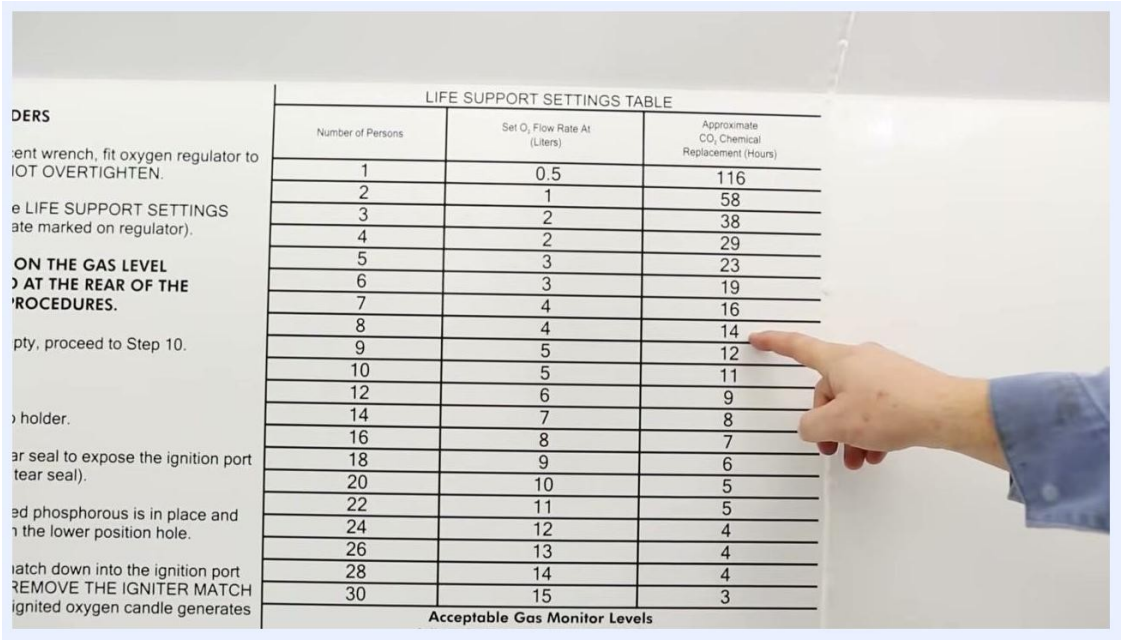
Close-up of the top of an oxygen candle showing the seal and warning label

Adjust settings and replace chemicals as the table and the gas monitor readings require.

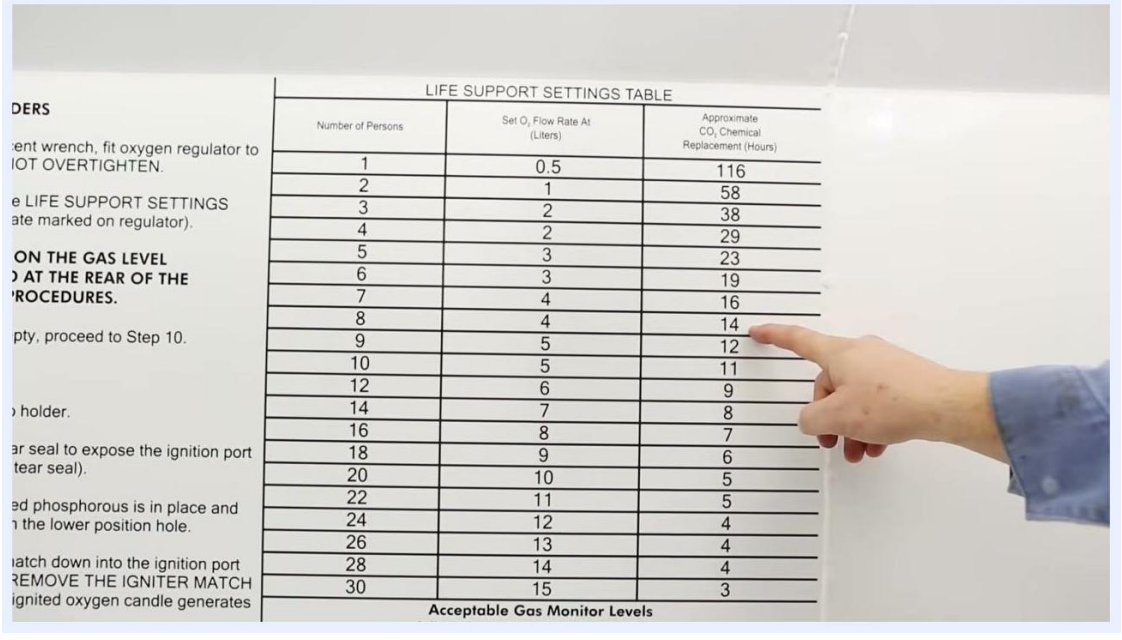
Step 7: Install the MARCISORB CO cartridge

1. Remove the MARCISORB carbon monoxide (CO) cartridge from its storage compartment. The compartment is labeled **MARCISORB CO** and holds a white box with yellow and green labeling.
2. Take the cartridge out of its packaging.

3. Place the cartridge on the left-hand side of the scrubber unit, with the rubber seal on the bottom side.



Operator removing the MARCISORB CO cartridge box from its labeled storage compartment, with a white box carrying a yellow and green label



MARCISORB CO cartridge installed on the left side of the scrubber unit, next to the green oxygen cylinders and the MARCISORB CO_2 cartridges

Once installed, the MARCISORB CO cartridge does not need replacing for the entire duration of use.

Step 8: Turn the scrubber unit on

1. Locate the scrubber unit control panel. It is a yellow panel with a digital display and labeled buttons.
2. Press the emergency operations button to turn the scrubber unit on. The button shows a white cross in a green square and is labeled **EMERGENCY**.



Scrubber unit control panel with a digital display, the green emergency button with a white cross, and warning and caution labels

Step 9: Install the oxygen regulator

1. Retrieve the oxygen regulator from the storage container near the oxygen cylinders. The container holds the regulator and other accessories.
2. Confirm that the oxygen regulator and the cylinder valve are free of oil, grease and other contaminants.
3. Put on the supplied gloves to prevent contamination.
4. Fit the oxygen regulator to the oxygen cylinder and tighten it securely. Do not over-tighten the connection.

5. Open the cylinder fully by rotating the valve counter-clockwise.



Operator retrieving the oxygen regulator from the storage container labeled for installing the oxygen regulator



Gloved hands fitting the oxygen regulator to the oxygen cylinder valve, secure but not over-tightened



Gloved hand turning the oxygen cylinder valve counter-clockwise to open it, with the regulator attached and ready for adjustment

Step 10: Set the oxygen regulator

1. Adjust the oxygen regulator to 0.5 liters per chamber occupant.
2. If the exact figure is not marked, round up to the nearest flow rate marked on the regulator dial.
3. For example, with 3 occupants, set the regulator to 2 liters, as shown in the Life Support Settings Table.

4. Refer to the Life Support Settings Table on the chamber wall for further information on oxygen flow rates.



Oxygen regulator dial set for 0.5 liters per chamber occupant, with flow rate settings clearly marked

Step 11: Confirm the oxygen regulator setting

1. Visually inspect the oxygen regulator attached to the oxygen cylinder. It is metallic with a green adjustment dial and flow rate markings from 1 to 6 liters. The cylinder and regulator are both labeled and color-coded green for oxygen.
2. Check that the arrow on the dial points precisely to the selected flow rate. The regulator label reads "NO FLOW BETWEEN SETTINGS" and "DIAL REG".
3. Confirm the dial is set to 0.5 liters per chamber occupant, rounded up to the nearest marked flow rate.

4. Make sure the regulator is securely attached and there are no leaks at the connection point.



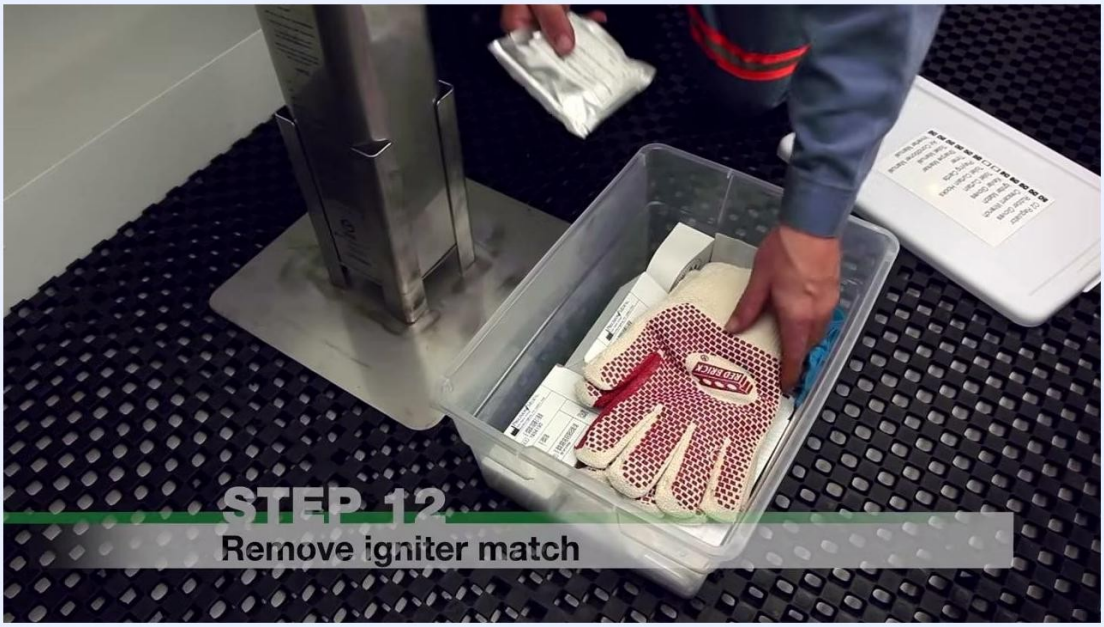
Close-up of the oxygen cylinder with the attached regulator, green dial set to a flow rate, markings 1–6 and the label "NO FLOW BETWEEN SETTINGS"



Close-up of a brass and green oxygen regulator on a gas cylinder, with a gloved hand adjusting the green dial

Step 12: Locate the Operating Procedures Manual

1. Find the yellow MineARC SYSTEMS cabinet on the chamber wall.
2. Identify the compartment labeled **OPERATING PROCEDURES MANUAL**.
3. Make sure you know where the manual is kept so you can refer to it for further instructions.



Person retrieving the igniter match from a supply box containing gloves and other items, with an on-screen instruction to remove the igniter match

Step 13: Prepare the oxygen candle

Only ignite the oxygen candle when all oxygen cylinders are empty. Keep monitoring the oxygen cylinder levels until that point.

1. Open the compartment labeled **OXYGEN CANDLE** on the wall.
2. Make sure your hands are free from oil or grease.
3. Remove the oxygen candle from its storage.
4. Hold the candle by its body and place it upright into the metal holder on the chamber floor. Make sure it is stable.

5. Position the candle holder away from any other objects or materials.

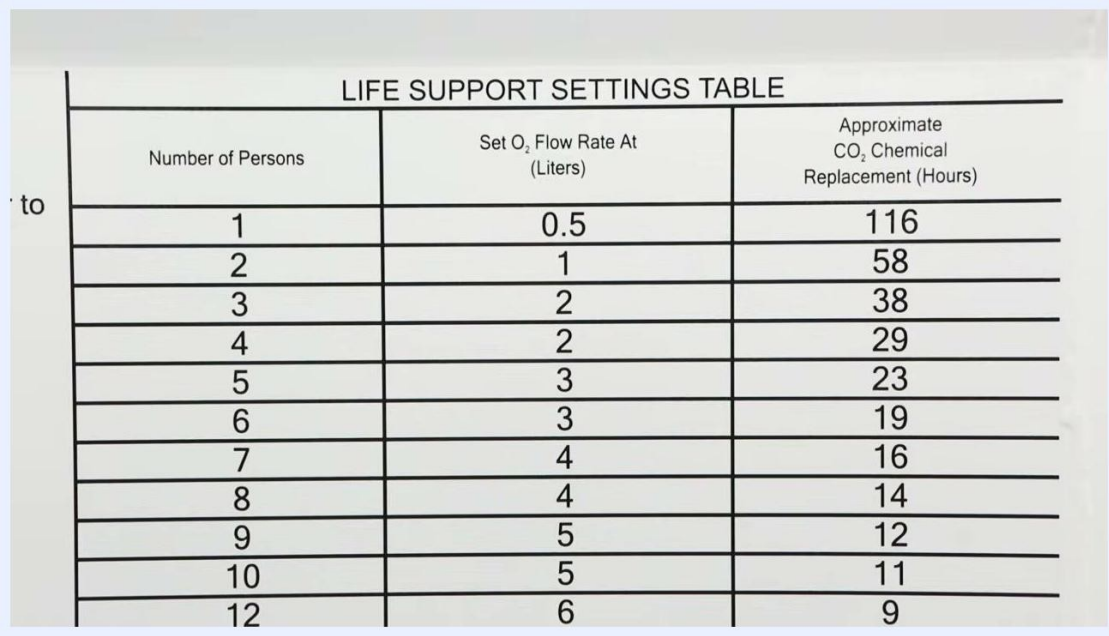


Person breaking the tear seal on the oxygen candle, with an on-screen instruction to break the tear seal

Step 14: Inspect the oxygen candle and holder

1. Check the steel structure of the candle and holder for damage, oil or grease contamination.
2. Examine the top and sides for dents, leaks or residue.
3. Confirm the seal on the candle has not been breached.

4. Stop and do not use the unit if the seal is broken or if the candle or holder is damaged or contaminated.



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Person in blue coveralls with orange reflective stripes sitting near the yellow MineARC SYSTEMS cabinet labeled OPERATING PROCEDURES MANUAL

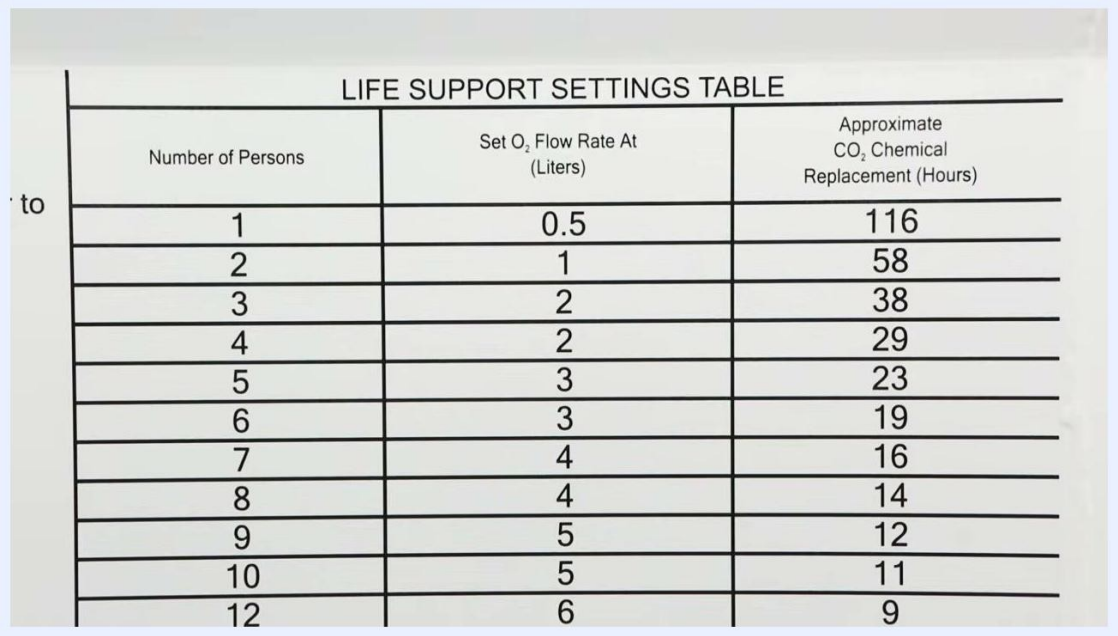
Step 15: Break the tear seal

1. With the candle secured in the holder, lift the T-handle on the oxygen candle.
2. Break the tear seal to expose the ignition port.
3. Watch for the exposed sharp edges on the tear seal to avoid injury.

Step 16: Remove and prepare the igniter match

1. Open the supply box near the oxygen candle holder.
2. Remove the igniter match from its container. The box may also hold gloves and other safety equipment.
3. Inspect the igniter match to make sure the red phosphorus tip is present and undamaged. Avoid direct contact with the tip.

4. Place the toggle bar into the lower position hole on the candle holder.



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Yellow MineARC SYSTEMS cabinet with the wall compartment labeled OXYGEN CANDLE and a step instruction to remove the candle and fit it into the holder

Step 17: Ignite the oxygen candle

1. Screw the igniter match down into the ignition port of the oxygen candle.
2. Follow the guideline to the lock position as specified in the operating procedures.

3. Ignite the candle as the operating procedure directs.



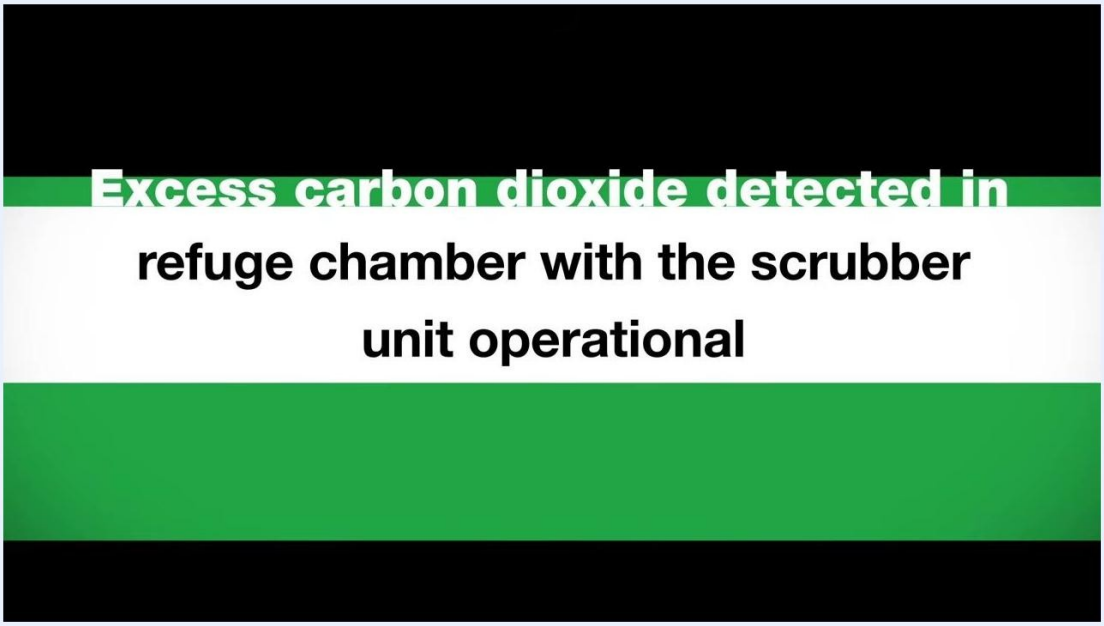
Operator seated in the refuge chamber holding the GASTEC sampling pump with a detector tube inserted, preparing for gas sampling

Step 18: Handle an ignited oxygen candle safely

An ignited oxygen candle generates extreme heat.

1. Use only the supplied gloves when you handle the candle after ignition.
2. Do not touch the candle or its holder with bare hands at any time after ignition.

3. Avoid unnecessary movement of the candle, and keep it upright and stable in its holder.



On-screen warning reading "Excess carbon dioxide detected in refuge chamber with the scrubber unit operational"

Step 19: Respond to carbon monoxide warnings with compressed air operational

1. Watch for the warning "Excess carbon monoxide detected in refuge chamber with compressed air operational." It means CO is above safe limits even though compressed air is being supplied.
2. Check the gas monitoring panel for real-time readings of CO_2 (%), CO (ppm) and O_2 (%).

3. If CO exceeds 25 ppm, take immediate action under your safety protocols. A red warning indicator shows on the CO display above the threshold. The example reading is 31.2 ppm.

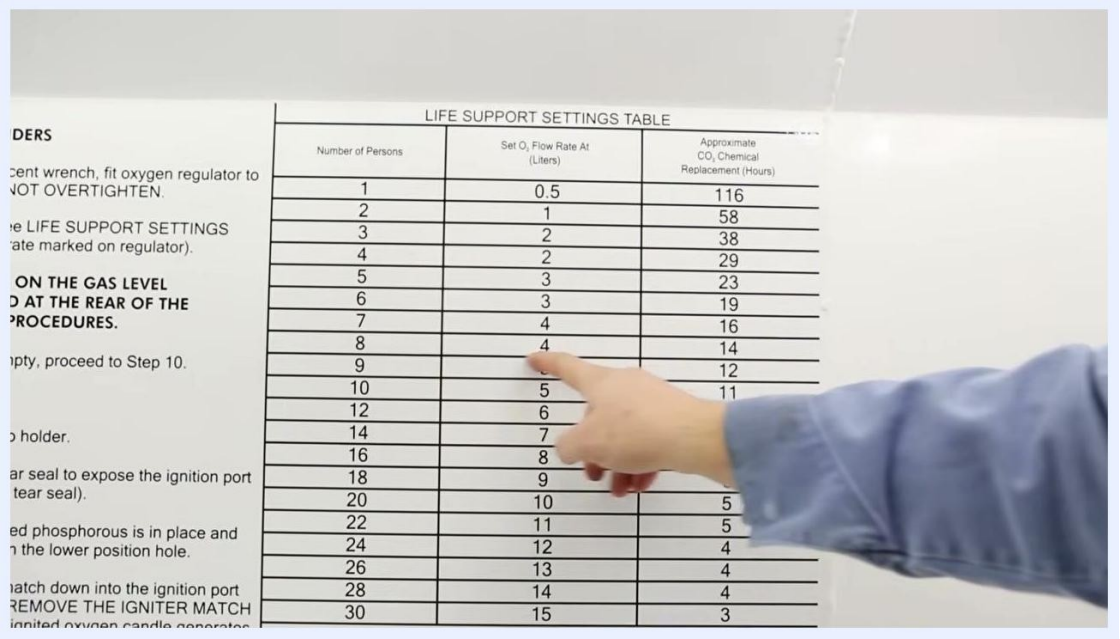


Close-up of the top of an ignited oxygen candle showing the metal toggle bar and warning label

Step 20: Respond to carbon dioxide warnings

1. If you see "Excess carbon dioxide detected in refuge chamber with the scrubber unit operational," the CO_2 scrubber is not maintaining safe levels.
2. Check the life support settings table for the correct MARCISORB CO_2 cartridge replacement interval for the number of persons in the chamber.

3. Replace the cartridges at that interval. Example intervals are 116 hours for 1 person, 19 hours for 6 persons and 11 hours for 10 persons.



Operator pointing to the Life Support Settings Table showing number of persons, O_2 flow rate in liters and CO_2 chemical replacement hours

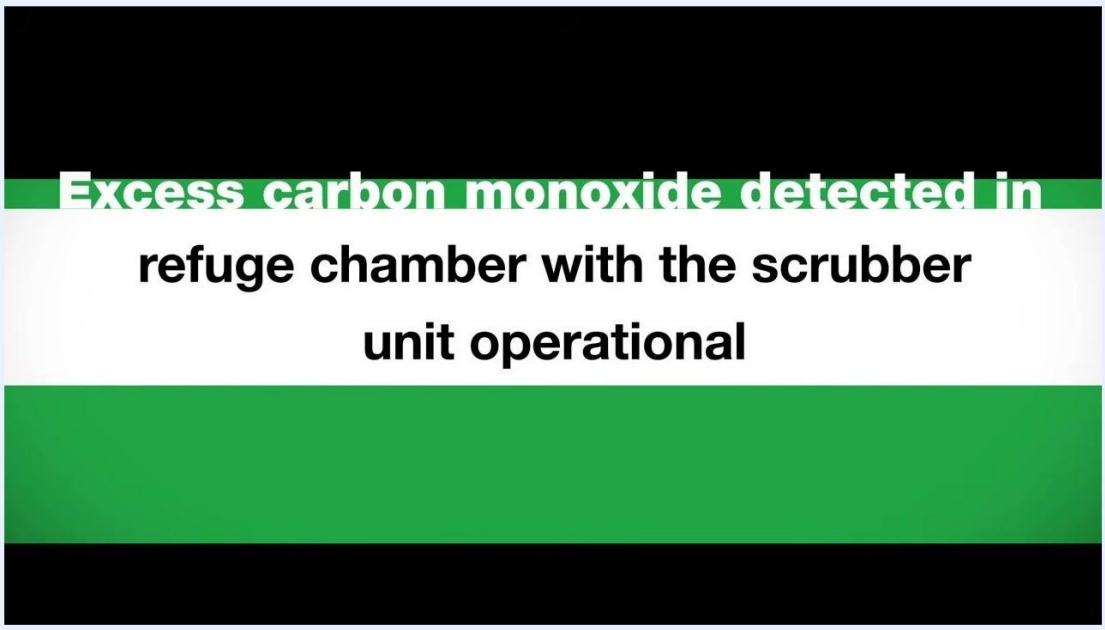
Step 21: Respond to carbon monoxide warnings with the scrubber operational

1. If you see "Excess carbon monoxide detected in refuge chamber with the scrubber unit operational," CO levels are unsafe despite the scrubber running.
2. Follow the emergency procedures in the operating manual.

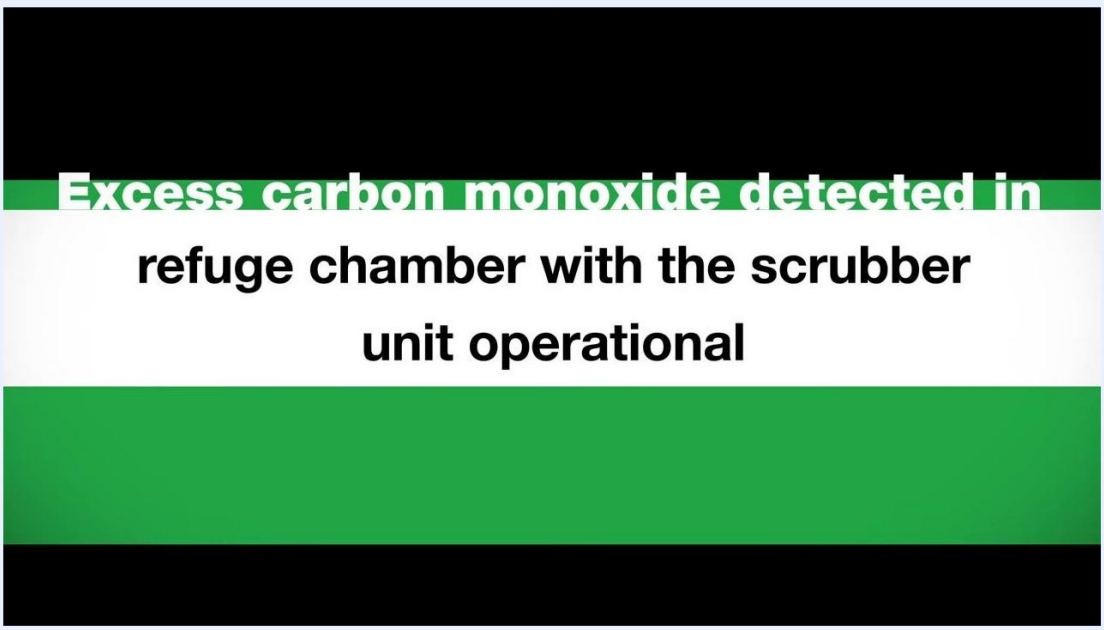
3. If the scrubber unit has already been activated, check that the MARCISORB CO cartridge is installed and functioning. Inspect the scrubber unit control panel to confirm this.



Person wearing the supplied gloves handling an ignited oxygen candle in its holder, with an on-screen reminder to always use supplied gloves



On-screen warning reading "Excess carbon monoxide detected in refuge chamber with the scrubber unit operational"



Second view of the on-screen warning for excess carbon monoxide with the scrubber unit operational

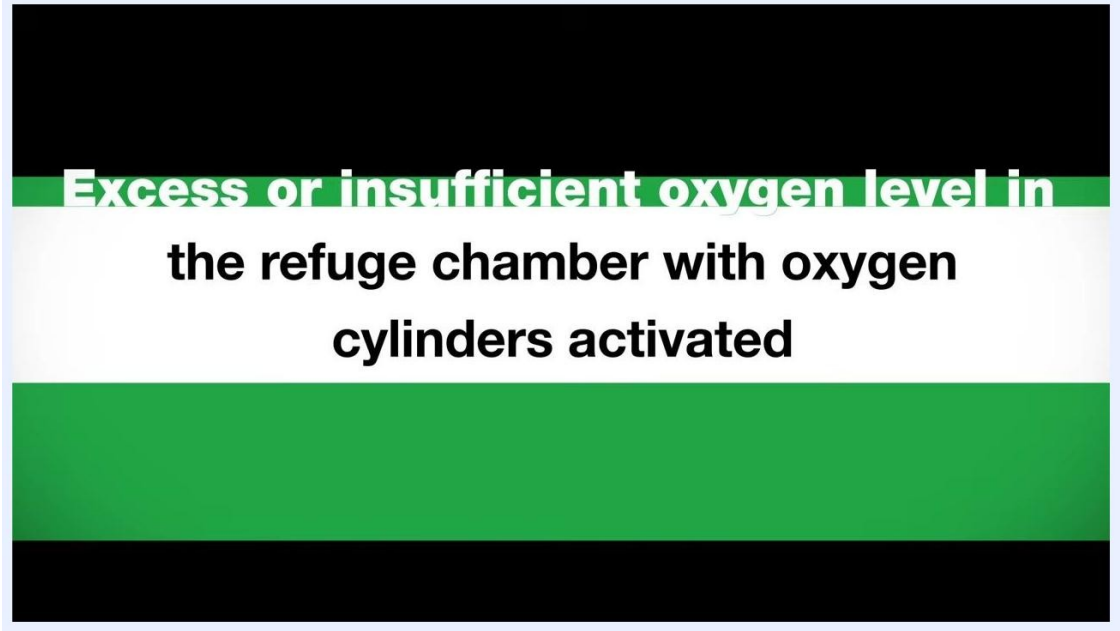
Step 22: Respond to oxygen level warnings

1. Watch for the warning "Excess or insufficient oxygen level in the refuge chamber with oxygen cylinders activated."
2. If oxygen falls below 18.5% or rises above 23%, adjust the oxygen regulator up or down to bring the level within the safe range.

3. Keep monitoring the gas panel until levels stabilize within the recommended limits.



On-screen warning reading "Excess carbon monoxide detected in refuge chamber with compressed air operational"



On-screen warning reading "Excess or insufficient oxygen level in the refuge chamber with oxygen cylinders activated"

Step 23: Read the digital gas monitoring panel

1. Observe the digital gas monitoring panel for real-time environmental data.
2. In the example, temperature reads 64.6°F (green indicator), oxygen reads 17.8% (red indicator, below the safe threshold) and carbon dioxide reads 0.15% (green indicator).
3. If O_2 is below 18.5% or above 23%, adjust the oxygen regulator up or down one notch accordingly.

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10	5	11
12	6	9
14	7	8
16	8	7
18	9	6
20	10	5

Life Support Settings Table used to find the CO_2 cartridge replacement interval for the number of persons in the chamber

Step 24: Identify the gas monitoring system for manual testing

1. Confirm whether your MineARC refuge chamber has a digital or a manual gas monitoring system.

2. Locate the gas monitoring panel. It may display temperature, O_2, CO_2 and CO readings.



Close-up of the GASTEC 31B oxygen detector tube packet, with an on-screen note about the three types of glass detector tubes

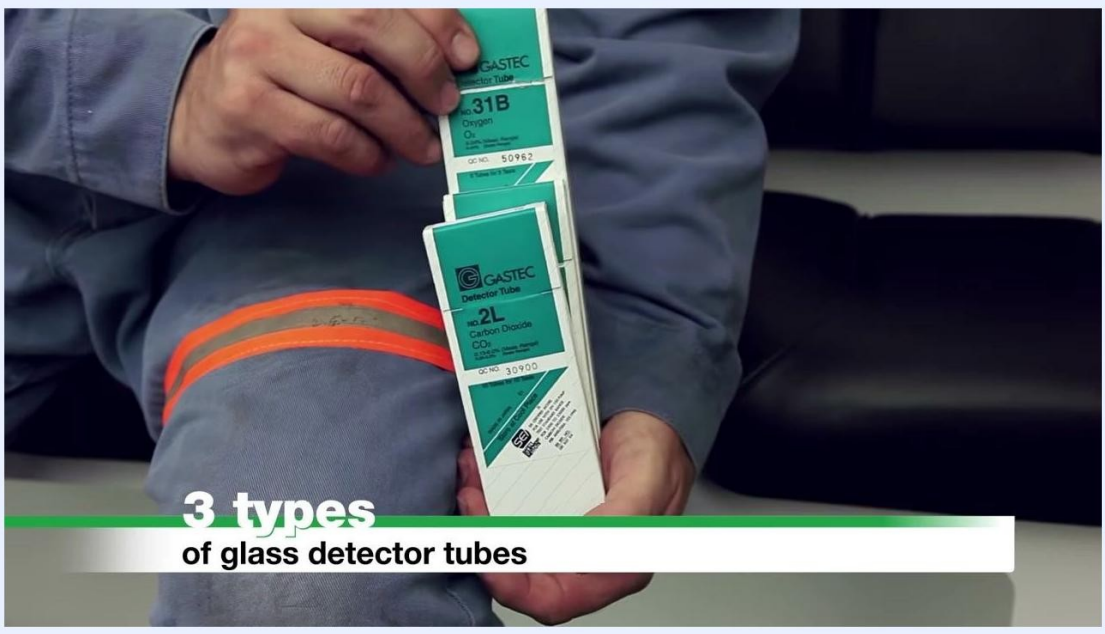
Step 25: Prepare for manual gas testing

1. Make sure the compressed air ball valve is fully open before you start.
2. Gather the GASTEC detector tubes for the gases you will test.

3. Identify the packets: GASTEC Detector Tube No. 31B for oxygen (O_2), No. 2L for carbon dioxide (CO_2) and No. 1LC for carbon monoxide (CO). There are three types of glass detector tubes.



Wide view of the gas monitoring panel with four digital displays and warning labels on the chamber wall



Person holding both the GASTEC 31B oxygen and 2L carbon dioxide detector tube packets

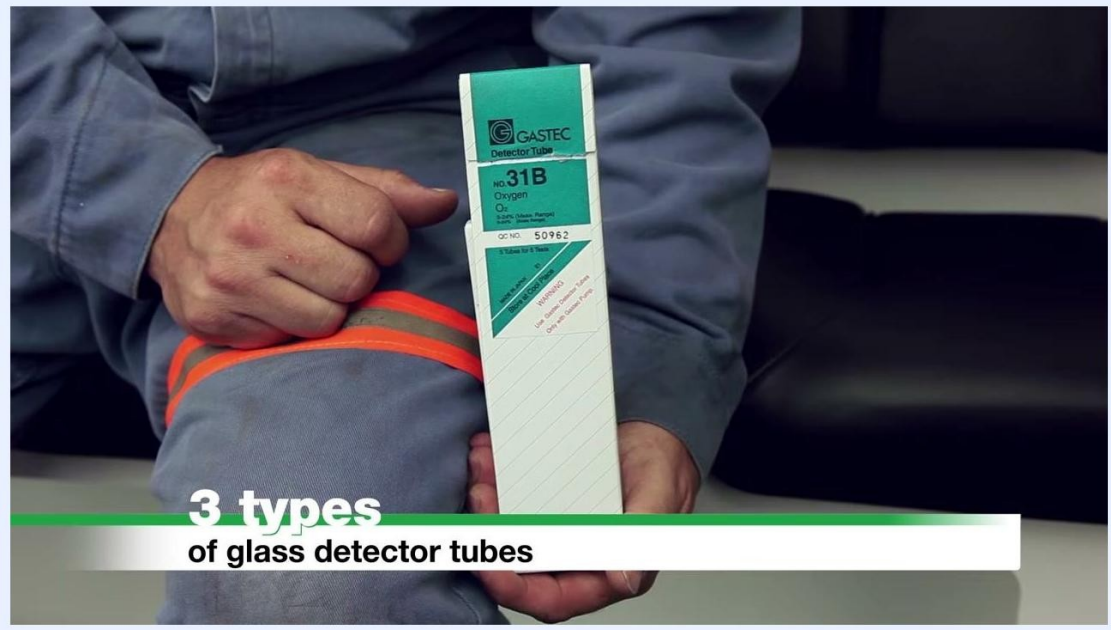
Step 26: Test oxygen with the 31B tube

1. Remove a 31B oxygen detector tube from its packet.
2. Confirm the pump handle is fully pushed in.
3. Break off both ends of the tube with the tube breaker on the GASTEC sampling pump.
4. Insert the prepared tube into the rubber inlet of the pump, with the arrow on the tube pointing toward the pump.

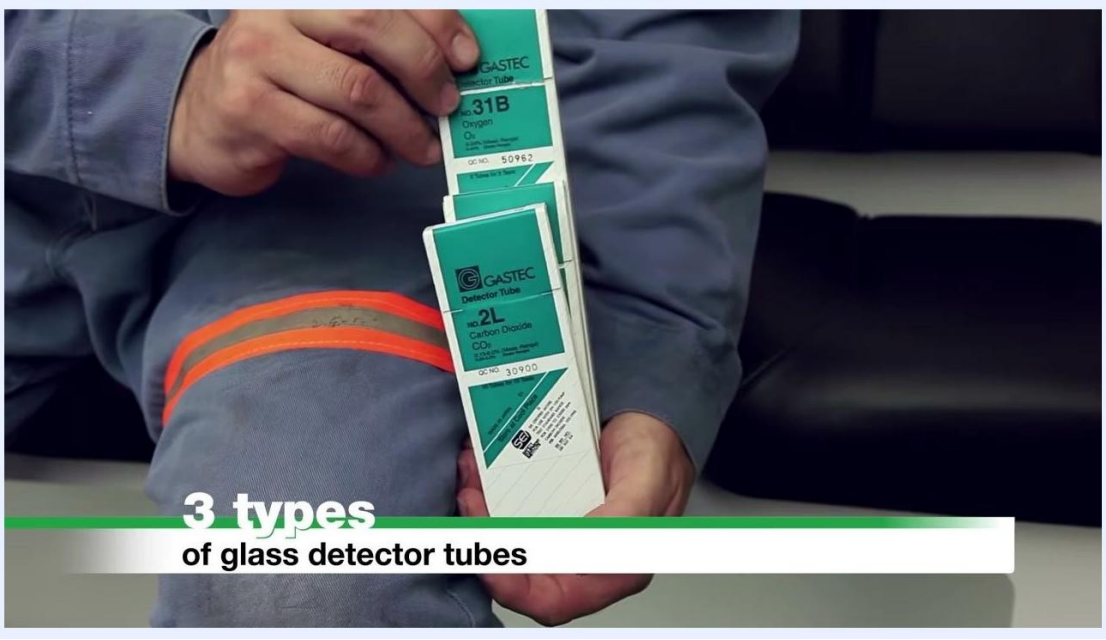
5. Align the red line on the back plate of the pump with the 50 milliliter (ml) guide mark. This draws the correct sample volume through the tube.



Digital gas monitoring panel showing temperature 64.6°F, O_2 17.8% with a red warning and CO_2 0.15%



Open GASTEC 31B oxygen detector tube packet with tubes visible, labeled as the oxygen level tube



Detector tube inserted into the GASTEC sampling pump with the TIP BREAKER label visible



GASTEC sampling pump with the red line aligned to the 50 ml mark and the operator's hand holding the pump

Step 27: Take the sample and read the result

1. Follow the specified sampling time for each detector tube. Wait until the required time has elapsed before you read the result.

2. Rotate the handle of the sampling pump a quarter turn and restore it to its initial position.
3. Remove the detector tube from the sampling pump.
4. Record the result on the results chart at the rear of the photographic operating procedures, using a pen.

5. If the oxygen level reaches 23% or greater, inspect the oxygen regulator on the cylinder and turn the dial back one notch.



Person holding GASTEC detector tube packets for oxygen (31B) and carbon dioxide (2L)



Person in a blue work uniform holding a pen and a gridded results chart on a clipboard, preparing to record data

Step 28: Test carbon dioxide with the 2L tube

1. Obtain a 2L carbon dioxide detector tube from its packaging.

2. Prepare the sampling pump for a 100 milliliter stroke.
3. Insert the CO_2 detector tube into the pump.
4. Operate the pump for the full sampling time, which is approximately 2 minutes for CO_2.



Close-up of GASTEC 31B Oxygen detector tube packet, on-screen text: "3 types of glass detector tubes"



Person holding a black GASTEC sampling pump with a CO_2 detector tube inserted, labeled TIP BREAKER

Step 29: Start the scrubber unit from the control panel

1. Locate the control panel for the scrubber unit (MineARC Systems).
2. Press the appropriate button to activate the CO_2 scrubber.

3. Make sure the display shows "CO2 Scrubber" as active.



Yellow MineARC SYSTEMS control panel with a display showing Emergency Mode and CO2 Scrubber checked, with warning and caution labels visible



Person pointing at the MineARC Systems scrubber unit control panel, which shows emergency mode and warning and caution labels

Step 30: Test carbon monoxide with the 1LC tube

1. Obtain a 1LC carbon monoxide detector tube.

2. Insert the tube into the sampling pump and set the pump for a 100 milliliter stroke.
3. Monitor the reading on the detector tube.
4. If the carbon monoxide level reaches 25 ppm or higher, follow your safety procedures and the emergency response protocol.

5. If the scrubber unit is already running, confirm that the MARCISORB CO cartridge is installed and functioning.



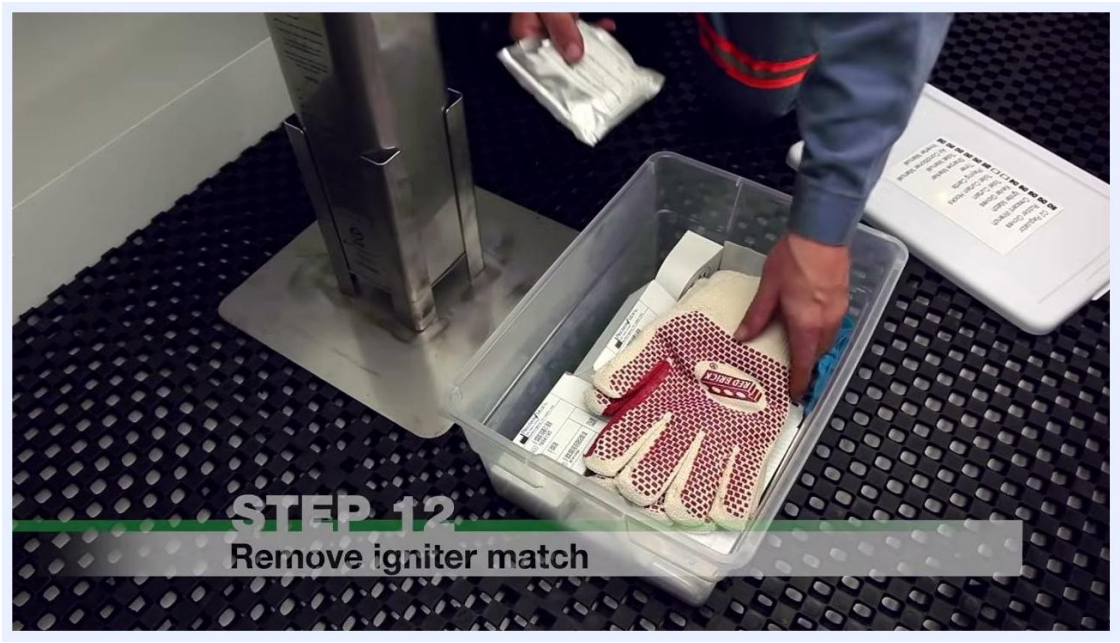
Person holding a box labeled 2L carbon dioxide detector tube with green and white packaging



Person holding a GASTEC sampling pump with a carbon monoxide detector tube inserted, labeled as the 1LC carbon monoxide detector tube

Step 31: Keep the chamber ready and refer to the manual

1. Refer to the photographic operating procedures for further instructions on operating the refuge chamber.
2. Open the operating procedures manual binder to the relevant section, such as "Gas Monitoring". It is typically stored near the control panels or safety equipment.
3. Follow the visual guides and written instructions for accurate operation.
4. Check the exterior of the chamber for readiness indicators such as status lights and safety labels.
5. Check that the capacity and unit number labels are visible and that the fire extinguisher is present and accessible.



Person inspecting the seal of an oxygen candle in its holder, with an on-screen warning not to use damaged or contaminated units

Step 32: Maintain the refuge chamber

1. Schedule and perform weekly checks of the chamber's systems, including gas monitoring, scrubber units and emergency supplies.
2. Arrange regular servicing by authorized personnel, such as MineARC Systems technicians.
3. During servicing, inspect all external and internal components, including fire extinguishers, doors and control panels.

4. For manuals, service requests and technical support, visit www.minearc.com.



Two workers in safety gear inspecting a MineARC refuge chamber, one checking the fire extinguisher and the other reviewing a checklist

Emergency response

The source gives the following actions for emergencies inside the chamber:

- Leave the siren on so personnel can locate the refuge chamber.
- If compressed air fails, or gas monitoring reads outside the acceptable gas levels, close the compressed air valve and install and start the scrubber (Steps 5 to 8).
- If CO is above 25 ppm, start the scrubber unit. If CO stays high with the scrubber running, follow the emergency procedures in the operating manual and check that the MARCISORB CO cartridge is installed.
- If O_2 is outside 18.5% to 23%, adjust the oxygen regulator.
- Once all oxygen cylinders are empty, use the oxygen candle as described in Steps 13 to 18.

- For further support, contact MineARC Systems through www.minearc.com.



Gas monitoring panel showing CO_2 at 0.06%, CO at 31.2 ppm (above the 25 ppm threshold) and O_2 at 20.9%

The source does not cover evacuation routes, muster points, first aid, rescue contacts or incident notification. Your site's emergency response plan belongs in this section. It should list the evacuation routes, muster point, first aid arrangements, rescue contact numbers and who to notify after an incident.

Records

Keep the following records:

- **Gas level recording charts:** Use the timer and marker in the chamber to record gas levels every hour. The charts are at the rear of the photographic operating procedures manual.
- **Manual sampling results:** Write each detector tube result on the results chart at the rear of the photographic operating procedures, using a pen.
- **Weekly checks and servicing:** Record the weekly checks of gas monitoring, scrubber units and emergency supplies. Record servicing by authorized personnel, including inspection of fire extinguishers, doors and control panels.

- **Compliance:** Record all actions and gas levels as required for safety compliance.



Person in a blue work shirt rotating the handle at the base of a black GASTEC manual gas sampling pump

The source does not state a retention period. Your site's records policy belongs here and should set how long the charts and inspection records are kept and where they are stored.